

**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF UTAH
CENTRAL DIVISION**

NAVAJO NATION , a federally recognized Indian tribe, et al., Plaintiffs, v. SAN JUAN COUNTY , a Utah governmental Subdivision	Civil No. 2:12-cv-00039-RS Judge Robert J. Shelby
EXPERT WITNESS REPORT OF DAVID ELY	

DAVID ELY, acting in accordance with 28 U.S.C. §1746, the Federal Rules of Civil Procedure 26(a)(2)(B), and Rules 702 and 703 of the Federal Rules of Evidence, does hereby declare and say:

1. I am the founder of Compass Demographics, a consulting and database management firm specializing in projects involving Census and Election Data. I have extensive experience managing redistricting projects, analyzing voting behavior, and analyzing demographics. I received a Bachelor of Science in Mechanical Engineering and Social Sciences from the California Institute of Technology in 1987.
2. I have served as an expert and testified on behalf of the United States in numerous cases involving voting rights issues, in which I performed analyses similar to those used in this report.
3. I have served as a consultant and expert on behalf of private plaintiffs in voting-rights litigation, challenging election systems in multiple jurisdictions.
4. I have served as a consultant and expert on behalf of defendant jurisdictions in voting rights litigation challenging election systems or districts.
5. I have served as a consultant to construct databases, draw district lines, and prepare presentation maps and reports for many jurisdictions in conducting their normal redistricting. These include statewide congressional and legislative redistricting in California, as well as a

variety of county boards, city councils, school boards, water districts, regional transit boards, and others following the Census in 1990, 2000, and 2010.

6. A copy of my Curriculum Vitae is attached as Exhibit A.

7. I was asked by the attorneys for the plaintiffs in this case to read and evaluate declarations from William Cooper and Kimball Brace submitted in connection with the Plaintiffs' First Requests for Admissions and San Juan County's Rule 56(d) Motion. I was expressly requested to analyze and discuss any problems or weaknesses with the Cooper declarations, as well as the Brace declarations.

8. This request was made on the afternoon of April 15, 2014, before which time I had no involvement in this matter, and had done no analysis of any jurisdiction within the State of Utah.

9. After reading the declarations and related documents, I downloaded and processed data from the Census Bureau and from the Utah Automated Geographic Reference Center (AGRC). I have also received and analyzed shapefiles from Mr. Cooper.

10. All of the analysis that is reflected in this report was completed by Saturday, April 19th; within four days after I first received the request.

11. This Report sets forth my analysis and responses to Mr. Brace's declarations, and specifically addresses the following areas: 1) accessibility of Census data; 2) verification of Census data for racial and ethnic classifications; selection of racial and ethnic classifications; 3) analysis of demographics of demonstration plans and proposed election districts; 4) information required to confirm or deny Mr. Cooper's reported demographic data; 5) Census geography of San Juan County, Utah by decade; 6) Census block assignment; 7) independent split-block analysis; and 8) my conclusions regarding Mr. Brace's declarations.

A. Accessibility of Census Data

12. Mr. Brace states that in order to obtain Census Data required to evaluate the Census related Requests for Admissions (specifically mentioning Request Nos. 1 and 3) requires "analysis, interpretation and/or extrapolation from data files..." He also states that it requires a researcher to be familiar with Census geographic codes and the procedures for extracting the data from a Statewide Census Data file.

13. Mr. Brace's statements are only true for levels of geography below the City or County.

14. For County level data, it is easy to go to the Census Bureau Website, in a section known as American Factfinder, and select the State of Utah and then the County of San Juan

from drop down lists. A search function allows a user to search for data on a particular subject like “race” or “ethnicity” in order to locate tables with the data in question.

15. Using this process, I was able to verify the accuracy of the data stated in Admission Requests 1-4 in less than 30 minutes. (See Exhibits B-H, U.S. Census Bureau tables.)

16. Building a block level database does require a level of expertise, but that expertise is a basic element of the qualifications Mr. Brace states that he possesses in Item 3 of each of his declarations.

17. I was able to download all of the necessary data from the 2010 Census, including Census geography and tabulations, and to process the data for use in my redistricting software in approximately three (3) hours. I was able to create a similar database for the 2000 Census in about 30 minutes, since the data is in the same format.

B. Verification of Census Data for Racial and Ethnic Classifications

18. Mr. Brace states that the racial classifications used in the Requests for Admissions cannot be verified or denied without knowing which of 291 columns of data were used to compile them.

19. The 291 columns Mr. Brace refers to are in the PL94 redistricting data file which is organized in 5 tables. (See Exhibit H, PL94-171 tables.)

20. Table P1 has total population by race, and P3 has Voting Age Population (VAP) by race.

21. Tables P2 and P4 contain population and VAP by Hispanic Origin and race.

22. The fifth table, H1, has three columns of Housing Occupancy data and is not used in this analysis.

23. The race categories are grouped by the number of races listed.

24. The one race group has a subtotal and 6 races listed.

25. For multi race groups there is a subtotal and each of the groups have a subtotal and every combination of the of the 5 races (2 races: 1 subtotal and 15 combinations, 3 races: 1 subtotal and 20 combinations, 4 races: 1 subtotal and 15 combinations, 5 races: 1 subtotal and 6 combinations, 6 races: 1 subtotal and 1 combination).

26. For Tables P01 and P03 there are 71 columns.

27. For Tables P02 and P04 there are an additional two columns; Hispanic or Latino, and a Not Hispanic or Latino subtotal.

28. While this is a significant number of columns, it is not difficult to understand or to combine. Mr. Brace certainly has enough experience to compile the categories he believes are most appropriate and offer an opinion as to whether demographic data in Plaintiff's Admission Requests are significantly different from those developed with his methodology.

C. Selection of Racial and Ethnic Classifications

29. The County's "General Objection" and Mr. Brace's Declarations argue that the racial categories Plaintiffs have selected to report reflect an attempt to skew or misrepresent Census data.

30. In fact, the selection of Racial and Ethnic Categories is not random or at the whim of the researcher.

31. Both the United States Justice Department (DOJ) and the Office of Management and Budget (OMB) have provided guidance on the use of Census data for Civil Rights and Voting Rights analysis. (See Exhibit I, OMB Bulletin and Federal Register Vols. 66 and 76 issues.)

32. The DOJ/OMB guidance has been followed in the construction of Redistricting Datasets for both the 2000 and 2010 redistricting cycles, and used in all Section 2 litigation under the Voting Rights Act that I am aware of.

33. The guidance provides that any individual who said they are Hispanic or any non-white race should be treated as minority, so the category of Non-Hispanic White is recognized to mean Non-Hispanic Single Race White.

34. Non-Hispanic Single Race White is a single field in the PL94 data, as well as in tables available from the Census Bureau's American Factfinder.

35. The guidance also provides that when a complaint involves a single minority group, any individual who lists that group should be counted in that group.

36. Therefore, the Census Bureau includes tables which list each racial group alone or in combination with other races.

37. The use of the term "Any Part Indian" clearly refers to the Census category "Race alone or in combination with one or more other races: American Indian and Alaska Native".

38. "Any Part Indian" is a category of total population available as a single field for San Juan County on American Factfinder, as well in SF1 data files (also available for download) at the Census Block Level.

39. In addition, the “Any Part Indian” category for both population and VAP can be easily computed from the PL94 data by adding together all of the detailed categories that include American Indians.

40. It has been common practice to create two simplified tables of race and ethnicity data; one an inclusive category for each minority racial group (any part) and one with exclusive categories, often referred to as DOJ categories. (See Exhibit J, Race and Ethnic Terminology table.)

41. Since these classifications have been in common usage since the release of the 2000 Census, they should certainly be familiar to Mr. Brace. (See Exhibit K, documentation for data used in 2001 Los Angeles County Redistricting.)

42. In addition, Mr. Brace suggests (in his first declaration at paragraph 18) that the inclusion of Alaska Natives could inflate the Indian Race category.

43. This concern is easily checked on American Factfinder. There are only seven (7) Alaska Natives shown in San Juan County, and four (4) of them listed an American Indian Tribe as well. These are too few to have any meaningful effect on the analysis. (See Exhibits F and G.)

D. Analysis of Demographics of Demonstration Plans and Proposed Election Districts

44. Mr. Brace states that he is unable to verify or deny the demographics reported for four Demonstration Plans and a Navajo Nation County Commission Proposal because he had received inadequate definition of these plans.

45. These plans were referred to in Mr. Cooper’s declaration as “Navajo Nation Proposal”, “Demonstration Commission Plan A”, “Demonstration Commission Plan B”, “Demonstration School District Plan A”, and “Demonstration School District Plan B”.

46. The data that was provided to me (which I believe to be the same data provided to Mr. Brace) from Mr. Cooper included a zip file named “Navajo_commission_proposal.zip”, which contained a single shapefile named “San Juan County shape files NN proposal”. This shapefile appeared to correspond to the “Navajo Nation Proposal”.

47. I used this shape file to assign census blocks to districts in my redistricting software. The resulting district demographics and geography match those shown in Exhibit G-1 and G-2 in Mr. Cooper’s Declaration.

48. The data provided also included a zip file named “Plaintiffs_Demonstrative_Plans.zip” which contained four shapefiles named “CC_DEMO_A”, “CC_DEMO_B”, “SD_DEMO_A”, and “SD_DEMO_B”.

49. These shapefiles clearly correspond to the County Commission (CC) and School District (SD) Demonstrative Plans A and B referred to in Mr. Cooper’s declaration.

50. Using these shapefile to assign Census blocks in my redistricting software, I was able to replicate the plans as shown in Mr. Cooper’s Exhibits Q (CC_DEMO_A) , R (CC_DEMO_B), S (SD_DEMO_A), and T (SD_DEMO_B). My independently created tabulation of census data for these five plans is included as Table 1, below.

See next page

Table 1 - Replication of Plans From Cooper Shape Files

Plan District	CC Navajo Nation Proposal			CC Demonstration Plan A			CC Demonstration Plan B		
	1	2	3	1	2	3	1	2	3
Population	4915	4917	4914	5078	4808	4860	5125	4721	4900
Deviation	0	2	-1	163	-107	-55	210	-194	-15
%	0.00%	0.04%	-0.02%	3.32%	-2.18%	-1.12%	4.27%	-3.95%	-0.31%
AP Indian	3887	3442	364	586	4104	3003	803	2994	3896
%	79.08%	70.00%	7.41%	11.54%	85.36%	61.79%	15.67%	63.42%	79.51%
NH Indian	3796	3380	312	519	4046	2923	757	2923	3808
%	77.23%	68.74%	6.35%	10.22%	84.15%	60.14%	14.77%	61.91%	77.71%
NH White	925	1382	4167	4084	656	1734	4049	1525	900
%	18.82%	28.11%	84.80%	80.43%	13.64%	35.68%	79.00%	32.30%	18.37%
Hispanic	160	106	383	412	79	158	265	230	154
%	3.26%	2.16%	7.79%	8.11%	1.64%	3.25%	5.17%	4.87%	3.14%
Voting Age Population	3171	3216	3342	3477	3158	3094	3470	3108	3151
AP Indian	2500	2176	221	365	2631	1901	519	1889	2489
%	78.84%	67.66%	6.61%	10.50%	83.31%	61.44%	14.96%	60.78%	78.99%
NH Indian	2466	2159	198	335	2615	1873	500	1865	2458
%	77.77%	67.13%	5.92%	9.63%	82.81%	60.54%	14.41%	60.01%	78.01%
NH White	619	985	2886	2866	493	1131	2793	1088	609
%	19.52%	30.63%	86.36%	82.43%	15.61%	36.55%	80.49%	35.01%	19.33%
Hispanic	68	51	227	239	38	69	149	132	65
%	2.14%	1.59%	6.79%	6.87%	1.20%	2.23%	4.29%	4.25%	2.06%

Plan District	SD Demonstration Plan A					SD Demonstration Plan B				
	1	2	3	4	5	1	2	3	4	5
Population	2810	2766	2949	2917	2817	2962	2922	2893	2743	2739
Deviation	-42	-86	97	65	-35	110	70	41	-109	-113
%	-1.47%	-3.02%	3.40%	2.28%	-1.23%	3.86%	2.45%	1.44%	-3.82%	-3.96%
AP Indian	176	540	1974	2668	2319	177	708	1945	2494	2353
%	6.26%	19.52%	66.94%	91.46%	82.32%	5.98%	24.23%	67.23%	90.92%	85.91%
NH Indian	134	517	1918	2617	2292	135	683	1890	2444	2326
%	4.77%	18.69%	65.04%	89.72%	81.36%	4.56%	23.37%	65.33%	89.10%	84.92%
NH White	2331	2123	885	220	472	2482	2104	864	219	362
%	82.95%	76.75%	30.01%	7.54%	16.76%	83.79%	72.01%	29.87%	7.98%	13.22%
Hispanic	310	86	115	71	34	310	91	110	71	34
%	11.03%	3.11%	3.90%	2.43%	1.21%	10.47%	3.11%	3.80%	2.59%	1.24%
Voting Age Population	1898	1847	1879	1933	1822	2018	1926	1842	1821	1772
AP Indian	107	341	1235	1740	1468	108	463	1217	1629	1474
%	5.64%	18.46%	65.73%	90.02%	80.57%	5.35%	24.04%	66.07%	89.46%	83.18%
NH Indian	86	334	1211	1725	1463	87	454	1193	1615	1470
%	4.53%	18.08%	64.45%	89.24%	80.30%	4.31%	23.57%	64.77%	88.69%	82.96%
NH White	1599	1449	601	173	335	1718	1402	584	172	281
%	84.25%	78.45%	31.99%	8.95%	18.39%	85.13%	72.79%	31.70%	9.45%	15.86%
Hispanic	188	48	51	30	16	188	50	50	29	16
%	9.91%	2.60%	2.71%	1.55%	0.88%	9.32%	2.60%	2.71%	1.59%	0.90%

AP Indian refers to Census Category "Race alone or in combination with one or more other races: American Indian and Alaska Native"

NH Indian refers to Non-Hispanic Indian alone plus Non-Hispanic Indian and White

NH White refers to Non-Hispanic White alone

E. Information Required to Confirm or Deny Mr. Cooper's Reported Demographic Data

51. Mr. Brace states that he is unable to perform an analysis since he has not been provided with plan configurations that "lead up to" the demonstration Plans, or information regarding the data Mr. Cooper looked at while creating them, including the extent to which Mr. Cooper relied on data from "Mette Research".

52. None of the information cited by Mr. Brace is relevant to confirming or denying that the particular configuration of geography Mr. Cooper produced has the Census Demographics that Mr. Cooper reports.

53. As discussed above, the shapefiles provided by Mr. Cooper allowed me to determine the Census Block Assignments for these plans and therefore to verify Mr. Cooper's numbers independently of whatever data Mr. Cooper was using. I created my own Census Block level datasets and with these I produced my own tabulations of Census Data in the election Districts.

54. Mr. Brace certainly has the expertise to create his own Census Block level datasets and use these to produce his own tabulations of Census Data in the election Districts.

F. Census Geography by Decade

55. Mr. Brace states that he cannot perform the required analysis without information regarding which decades Census Geography was used in the creation of shape files which were responsive to Defendant's Document Request Nos. 1,2,3, and 4.

56. The plaintiffs' response to Interrogatory 7 clearly identifies which decades Census geography and demographic data was used in the creation of the shapefiles in request Nos. 1 and 2 (Demonstrative Plans.)

57. This is the only information necessary to independently verify or deny the accuracy of Census Data reported in Mr. Cooper's Declaration.

58. The shapefiles from Request Nos. 3 and 4 are not necessary for independent verification, since they represent geography that can be obtained independently.

59. In my analysis, I created my own version of the boundaries referred to in paragraph 58 utilizing precinct and section geography downloaded from Utah AGRC, as well as the maps included as Exhibits B1-B3 of Cooper's February 14 Declaration. I do not have the ability to verify the District Configuration relative to precincts shown in those exhibits, but that information is certainly available to Defendants.

60. The ability to create a representation of pre-existing districts is a basic part of a redistricting experts work.

G. Census Block Assignment

61. Mr. Brace states that he has not been provided with sufficient data to analyze the allocation of Census block data to District for the Current County Commission and School Board Districts.

62. Mr. Cooper's declaration makes clear that the demographic data provided in the declaration for precinct based plans is a Census block level approximation of the Districts.

63. Mr. Brace's Exhibit B demonstrates his ability to use the provided shapefiles to make Census block assignments to election districts.

64. Using the same methodology, Mr. Brace could have easily replicated the five proposed or demonstrative plans, as I did.

65. The allocation of Census block data also highlights an issue concerning the methodology used by Mr. Cooper, who stated as follows:

“In a few areas of the county, populated census blocks and VTDs are split by PLS section lines. This means that plans drawn at the precinct level involve population estimates, but the district-by-district population impact is relatively minor.”

(Cooper Decl page 7 line 3)

66. As is shown below in Paragraphs 67 - 73, in the final analysis, alternatives to the methodology used by Mr. Cooper in how he handled split blocks produced inconsequential differences in results and can be analyzed without requiring additional data or information from Mr. Cooper.

H. Independent Split Block Analysis

67. In order to analyze the potential effect of the whole block approximations Mr. Cooper relied on, I examined the current County Commission and School District Plans as well as the “1986” Commission Plan with respect to 2010 Census Geography and Data.

68. I also examined the current School District Plan and the 1986 County Commission Plan with respect to the 2000 Census Geography and Data.

69. For each of these Plan and Decade combinations, I carried out the same analytical procedure, as follows:

a. I created a version of the Plan using a combination of Census Geography and Precinct/ PLSS data from the Utah AGRC.

b. I used the shapefiles provided by Mr. Cooper to duplicate his whole block assignment to districts. I refer to this as the Cooper Assignment.

c. I created an alternative block assignment, referred to as Ely Assignment, with the following steps:

i. I used the precinct based Plan as created in Step “a” to assign blocks which are wholly contained in districts (as in Brace Exhibit B).

ii. I assigned unpopulated Blocks as convenient. Unpopulated block assignments do not affect the demographics of the districts.

iii. For populated Blocks that only had a very small area split, I used my GIS software to overlay the small area on Google Earth. I then examined the area imagery to see if there were any structures or developed areas. If the area was small enough to examine easily and appeared to be completely unpopulated I assigned the block to the district containing the larger area of the block. If the area was too large to easily examine or if there appeared to be any population in the small area, I assigned the block to a split block group for the districts involved.

d. I overlaid the Plan created in step “a” on the Census Block geography and used a procedure included in my GIS Software to estimate the District demographic data from the Census Block data by allocating split Block data to districts based on the geographic area of overlap. I refer to this as the Overlay Assignment.

e. I created a chart comparing the demographic data provide by the three different assignments.

f. I created a map of each block assignment showing populated blocks in color by district assignment together with the election District boundaries based on precinct and section lines.

70. The results of this analysis are shown in Exhibits L-P, split block analysis tables and maps. In all cases, the Overlay Assignment is almost identical to the Cooper Assignment in terms of percentages by race.

71. The Ely Assignment, which leaves split Blocks out of districts, has differences that are somewhat greater but are inconsequential in terms of Mr. Cooper's conclusions regarding the treatment of Indian population in these plans.

72. Mr. Cooper's conclusions would be equally valid with any of these results as well as any possible assignment of the remaining split blocks.

73. The reason for this is clear from the maps as well as the population of blocks left unassigned in the Ely assignment: the great majority of split Blocks are unpopulated, and the total population of the remaining split Blocks is less than 3% of the County population in all cases.

I. Conclusion

74. In my opinion, based on my knowledge of Census Data and Geography and my experience as a Redistricting Consultant and as an expert in numerous Voting Rights cases, Mr. Brace has all of the information necessary to evaluate the 2000 and 2010 Census data reported in Mr. Cooper's declaration and included in Plaintiff's Request for Admissions.

75. In my opinion, due to the size of San Juan County and the small number of members of the County Commission and School Board, this analysis could have been completed quickly. I was able to complete the analysis in less than four days.

76. It is also my opinion, based on my independent analysis of the San Juan County Census Data and District configurations, that the data reported by Mr. Cooper is substantively correct, and that any independent analysis by a qualified professional would find very similar numbers, consistent with the conclusions that Mr. Cooper reached.

J. Disclosure Statement

My Curriculum Vitae, attached as Exhibit A, contains a list of my publications and all other cases in which I have testified as an expert at trial or by deposition. I was paid for my work on this project at a rate of \$150.00 per hour.

EXECUTED on August 25, 2015.



David Ely

CERTIFICATE OF SERVICE

I hereby certify that on the 26th day of August, 2015, I electronically filed the foregoing **EXPERT WITNESS REPORT OF DAVID ELY** with the U.S. District Court for the District of Utah. Notice will automatically be electronically mailed to the following individual(s) who are registered with the U.S. District Court CM/ECF System:

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